



SEQUENCE LISTING

RECEIVED

NOV 20 2002

TECH CENTER 1600/2900

<110> KIM, Jong-Bae

<120> CRUDE EXTRACT FROM Viscum album coloratum, AND PROTEINS
AND LECTINS ISOLATED THEREFROM

<130> Korean Mistletoe Lectin

<140> 09/627,165

<141> 2000-07-27

<160> 80

<210> 1

<211> 762

<212> DNA

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 1

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cgtcagtcta cgatccccgt ctgggatgcg caaagatttg tgttggtgga actcaccaat 180
cagggggggag actcgatcac ggccgccatc gacgttacta acctgtacgt ggtggcttac 240
caagcagggc accaatccta ctttttgcgc gacgcaccag acggcgcgga aaggcatctc 300
ttcaccggca ccaccagatc ctccctccca ttcaccgaa gctacacaga tctggagcga 360
ttcgccggtc atagggacca gatccctctg ggtagagagg aactcattca atccgtctcg 420
gcccttcgtt ttccgggcag caacactcgt gcccaagctc gttcctttat catcctcatt 480
cagatgatct ccgaggccgc cagattcaat cccatcttat ggagggctcg ccaatacatt 540
agcagtgggg ggtcatttct gccagacacg tacattctcc agctggagac gagttggggg 600
caacaatcca cgcaagttca gcactcgacg gatggcggtt ttaataaccc aattcggttg 660
actatatcca ctggtgtctt cgtgacgttg agcaatgttc ccgacgtgat cgccagctta 720
gcgatcatgt tgtttgatg cgaggaccgg ccattctcct ct 762

<210> 2

<211> 254

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 2

Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val Ser Ser Gly Ser
20 25 30

Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln Ser Thr Ile Pro Val Ser
35 40 45

Asp Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Gly Gly Asp
50 55 60

Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Leu Tyr Val Val Ala Tyr
65 70 75 80

Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Asp Gly Ala
85 90 95

Glu Arg His Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe Thr
100 105 110

Gly Ser Tyr Thr Asp Leu Glu Arg Phe Ala Gly His Arg Asp Gln Ile
115 120 125

Pro Leu Gly Arg Glu Glu Leu Ile Gln Ser Val Ser Ala Leu Arg Phe
130 135 140

Pro Gly Ser Asn Thr Arg Ala Gln Ala Arg Ser Phe Ile Ile Leu Ile
145 150 155 160

Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg Ala
165 170 175

Arg Gln Tyr Ile Ser Ser Gly Gly Ser Phe Leu Pro Asp Thr Tyr Ile
180 185 190

Leu Gln Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln His
195 200 205

Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Thr Ile Ser Thr
210 215 220

Gly Val Phe Val Thr Leu Ser Asn Val Arg Asp Val Ile Ala Ser Leu
225 230 235 240

Ala Ile Met Leu Phe Val Cys Glu Asp Arg Pro Ser Ser Ser
245 250

<210> 3

<211> 762

<212> DNA

<213> Viscum album coloratum

<220>

<221> misc_feature

D1
cont

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 cggcagtcta ctgtccccgt ctccgatacg cagagatttg tgttggtgga actcagcaat 180
 cagggggggag actcgatcac ggcggccatc gacgttacca atctgtacgt ggtgggttac 240
 caagcaggca accaatccta ctttttgcgc gacgcacctc gcggcgcgga aacgtatctc 300
 ttcaccggca ccaccgatc ctctctccca ttcaacggaa gctaccctga tctggagcga 360
 tacgccggac atagggacca gatccctctc ggtatagacc aactcattca atccgtctcg 420
 gcccttcggt ttccgggcag caacactcgt gcccaagctc gttcctttat catcctcatt 480
 cagatgatct ccgaggccgc cagattcaat cccatcttat ggagggtctg ccaatacatt 540
 agcagtgggg ggtcatttct gccagacacg tacattctcc agctggagac gagttggggg 600
 caacaatcca cgcaagttca gcactcgacg gatggcggtt ttaataaccc aattcggttg 660
 actatatcca ctggtgtctt cgtgacgttg agcaatgttc gcgacgtgat cgccagcyta 720
 gcgatcatgt tgtttgtatg cgaggaccgg ccatcttctt ct 762

<210> 4
 <211> 254
 <212> PRT
 <213> Viscum album coloratum

<220>

<221> misc_feature
 <222> 240
 <223> Xaa = any amino acid

<400> 4
 Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Asp Gln
 1 5 10 15
 Tyr Phe Lys Phe Ile Thr Leu Leu Arg Asp His Val Ser Ser Gly Ser
 20 25 30
 Leu Ser Asn Gln Ile Pro Leu Leu Arg Gln Ser Thr Val Pro Val Ser
 35 40 45
 Asp Thr Gln Arg Phe Val Leu Val Glu Leu Ser Asn Gln Gly Gly Asp
 50 55 60
 Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Leu Tyr Val Val Ala Tyr
 65 70 75 80
 Gln Ala Gly Asn Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala
 85 90 95
 Glu Thr Tyr Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro Phe Asn
 100 105 110

P1
cont.

Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln Ile
115 120 125

Pro Leu Gly Ile Asp Gln Leu Ile Gln Ser Val Ser Ala Leu Arg Phe
130 135 140

Pro Gly Ser Asn Thr Arg Ala Gln Ala Arg Ser Phe Ile Ile Leu Ile
145 150 155 160

Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp Arg Ala
165 170 175

Arg Gln Tyr Ile Ser Ser Gly Gly Ser Phe Leu Pro Asp Thr Tyr Ile
180 185 190

Leu Gln Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln His
195 200 205

Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Thr Ile Ser Thr
210 215 220

Gly Val Phe Val Thr Leu Ser Asn Val Arg Asp Val Ile Ala Ser Xaa
225 230 235 240

Ala Ile Met Leu Phe Val Cys Glu Asp Arg Pro Ser Ser Ser
245 250

<210> 5
<211> 768
<212> DNA
<213> Viscum album coloratum

<220>

<221> misc_feature

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cctccgtcaa tcccgtctc ctctgcgcag agatttgtgt tgggtggaact caciaaatcag 180
ttgggaaagt gggaagactc gatcacggcc gccatcgacg ttaccaatct gtacgtggtg 240
gcttaccaag caggcgacca atctactttt ttgcgcgacg caccagacgg cgcggaagg 300
catctcttca cgggcaccac cagatcctct cttcctttca acggaagcta cgctgatctg 360
gagcgggtacg cgggacatag ggaccggatc cctctgggta gagagcact catacgatcc 420
gtctcggcgc ttgattatcc cggcggcagc acgcgcgccc aagccagttc cattattatc 480
gtcattcaga tgatctccga ggcgccaga ttcaatccca tcctatggag ggctcgccaa 540
tacattaaca gtggggtgtc atatcttcca gacgtgtaca tgctggagct ggaggcgagt 600
tggggccaac aatcgacca agtccagcag tcgaccgatg gcgtttttaa taaccaatt 660

cggttgggta tatccaccgg caacttcgtg tggttgagca atgttcgcga cgtgatcgcc 720
agcttggggga tcatgggtgtt tgtatgcagg gaccggtcat cttcccct 768

<210> 6
<211> 256
<212> PRT
<213> Viscum album coloratum

<220>
<221> misc_feature

<400> 6
Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
1 5 10 15
Tyr Phe Arg Phe Ile Lys Leu Leu Arg Asp Ser Val Ser Ser Gly Ser
20 25 30
Phe Ser Asn Asp Ile Pro Leu Leu Pro Pro Ser Ile Pro Val Ser Ser
35 40 45
Ala Gln Arg Phe Val Leu Val Glu Leu Thr Asn Gln Leu Gly Lys Trp
50 55 60
Glu Asp Ser Ile Thr Ala Ala Ile Asp Val Thr Asn Leu Tyr Val Val
65 70 75 80
Ala Tyr Gln Ala Gly Asp Gln Ser Tyr Phe Leu Arg Asp Ala Pro Asp
85 90 95
Gly Ala Glu Arg His Leu Phe Thr Gly Thr Thr Arg Ser Ser Leu Pro
100 105 110
Phe Asn Gly Ser Tyr Ala Asp Leu Glu Arg Tyr Ala Gly His Arg Asp
115 120 125
Arg Ile Pro Leu Gly Arg Glu Pro Leu Ile Arg Ser Val Ser Ala Leu
130 135 140
Asp Tyr Pro Gly Gly Ser Thr Arg Ala Gln Ala Ser Ser Ile Ile Ile
145 150 155 160
Val Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Leu Trp
165 170 175
Arg Ala Arg Gln Tyr Ile Asn Ser Gly Val Ser Tyr Leu Pro Asp Val
180 185 190
Tyr Met Leu Glu Leu Glu Ala Ser Trp Gly Gln Gln Ser Thr Gln Val
195 200 205
Gln Gln Ser Thr Asp Gly Val Phe Asn Asn Pro Ile Arg Leu Gly Ile
210 215 220
Ser Thr Gly Asn Phe Val Trp Leu Ser Asn Val Arg Asp Val Ile Ala

20										25					30														
Ser	Arg	Ile	Gln	Leu	Trp	Pro	Cys	Lys	Ser	Asn	Ser	Asp	Gln	Asn	Gln														
		35					40					45																	
Leu	Trp	Thr	Ile	Arg	Arg	Asp	Gly	Thr	Ile	Arg	Ser	Asn	Gly	Arg	Cys														
	50					55					60																		
Leu	Thr	Thr	Tyr	Gly	Tyr	Thr	Ala	Gly	Ser	Tyr	Ile	Met	Ile	Tyr	Asp														
	65				70					75					80														
Cys	Asn	Arg	Gly	Gly	Trp	Asp	Leu	Thr	Thr	Trp	Gln	Ile	Arg	Gly	Asn														
				85					90					95															
Gly	Ile	Ile	Leu	Asn	Pro	Arg	Ser	Met	Met	Val	Ile	Gly	Thr	Pro	Ser														
			100					105					110																
Gly	Ser	Arg	Gly	Thr	Arg	Gly	Thr	Thr	Phe	Thr	Leu	Gln	Thr	Leu	Gly														
		115					120					125																	
Tyr	Ser	Leu	Gly	Gln	Gly	Trp	Leu	Ala	Ser	Asn	Asp	Thr	Ala	Pro	Arg														
	130					135					140																		
Glu	Val	Thr	Ile	Tyr	Gly	Phe	Arg	Asp	His	Cys	Met	Glu	Thr	Ser	Gly														
	145				150					155					160														
Gly	Lys	Val	Trp	Val	Gly	Thr	Cys	Val	Ser	Gly	Lys	Gln	Asn	Gln	Arg														
				165					170					175															
Trp	Ala	Leu	Tyr	Gly	Asp	Gly	Ser	Ile	Arg	Pro	Lys	Pro	Tyr	Gln	Asp														
		180						185					190																
Gln	Cys	Leu	Thr	Ser	Gln	Gly	Asp	Ser	Val	Arg	Ser	Val	Ile	Asn	Leu														
		195					200					205																	
Phe	Ser	Cys	Thr	Ala	Gly	Ser	Pro	Arg	Gln	Arg	Trp	Val	Phe	Thr	Asn														
	210					215					220																		
Lys	Gly	Ala	Ile	Leu	Asn	Leu	Lys	Asn	Arg	Leu	Ala	Met	Asp	Val	Ala														
	225				230					235					240														
Glu	Ser	Asn	Pro	Ser	Leu	Arg	Arg	Ile	Ile	Ile	Phe	Ser	Val	Thr	Gly														
				245					250					255															
Asn	Pro	Asn	Gln	Met	Trp	Leu	Pro	Val	Pro																				
			260					265																					

<210> 9

<211> 789

<212> DNA

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 9

gacgatggta cctgcactgc ttccgaacct acggtgcgga ttgtgggtct aaatggcctg 60

tgcgtcgacg tccgaaatgg aaaattccac gatggaaatc cgatacagtt gtggccctgc 120

aagtccaaca ccgataggaa tcagctgtgg acgatcagaa gggatggaac cattcgatct 180
aatagcaagt gcttgaccac ctatggctat cgtgatggca tgtatgtaat gatctacaac 240
tgtaatacgg ccgtgcggga ggccactatt tggcaaatat gggaaaatgg aaccatcggt 300
aatccaagat ccagtctggt actgggagca gcatctggaa acagccgcac taggcttact 360
gtgcaaacac aggcttactc gttgggacag ggctggcttg ccagcaatga taccgcccct 420
cgcgaggtaa ccatatacgg atttcgtgac ctttgcattg aagctaattg atcgagtgtg 480
tgggtggaga cttgtgtgag taacaagcag aaccaaaaat gggctttgta cggggatggg 540
tctatacgcc ccaaacaata ccgaaaccaa tgccctcacct gccagaaaga ctccgtttca 600
accgtaatca atattgttag ctgcagcgca ggatcgtctg ggcagcgatg ggtgtttacc 660
aataaaggga ccattttgaa tttaaagaat gggtttgtca tggatgtggc gcaatcaaat 720
ccaagcctcc gccgaataat catctacca gccaccggaa agcctaata aatgtggctt 780
cccgtgcca 789

<210> 10
<211> 263
<212> PRT
<213> *Viscum album coloratum*

<220>

<221> misc_feature

<400> 10

Asp	Asp	Gly	Thr	Cys	Thr	Ala	Ser	Glu	Pro	Thr	Val	Arg	Ile	Val	Gly
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Leu	Asn	Gly	Leu	Cys	Val	Asp	Val	Arg	Asn	Gly	Lys	Phe	His	Asp	Gly
		20						25					30		
Asn	Pro	Ile	Gln	Leu	Trp	Pro	Cys	Lys	Ser	Asn	Thr	Asp	Arg	Asn	Gln
		35					40					45			
Leu	Trp	Thr	Ile	Arg	Arg	Asp	Gly	Thr	Ile	Arg	Ser	Asn	Ser	Lys	Cys
	50					55					60				
Leu	Thr	Thr	Tyr	Gly	Tyr	Arg	Asp	Gly	Met	Tyr	Val	Met	Ile	Tyr	Asn
	65				70					75				80	
Cys	Asn	Thr	Ala	Val	Arg	Glu	Ala	Thr	Ile	Trp	Gln	Ile	Trp	Glu	Asn
				85					90					95	
Gly	Thr	Ile	Val	Asn	Pro	Arg	Ser	Ser	Leu	Val	Leu	Gly	Ala	Ala	Ser
			100					105					110		
Gly	Asn	Ser	Arg	Thr	Arg	Leu	Thr	Val	Gln	Thr	Gln	Ala	Tyr	Ser	Leu
		115					120					125			

Gly Gln Gly Trp Leu Ala Ser Asn Asp Thr Ala Pro Arg Glu Val Thr
 130 135 140
 Ile Tyr Gly Phe Arg Asp Leu Cys Met Glu Ala Asn Gly Ser Ser Val
 145 150 155 160
 Trp Val Glu Thr Cys Val Ser Asn Lys Gln Asn Gln Lys Trp Ala Leu
 165 170 175
 Tyr Gly Asp Gly Ser Ile Arg Pro Lys Gln Asn Arg Asn Gln Cys Leu
 180 185 190
 Thr Cys Gln Lys Asp Ser Val Ser Thr Val Ile Asn Ile Val Ser Cys
 195 200 205
 Ser Ala Gly Ser Ser Gly Gln Arg Trp Val Phe Thr Asn Lys Gly Thr
 210 215 220
 Ile Leu Asn Leu Lys Asn Gly Leu Val Met Asp Val Ala Gln Ser Asn
 225 230 235 240
 Pro Ser Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn
 245 250 255
 Gln Met Trp Leu Pro Val Pro
 260

<210> 11
 <211> 789
 <212> DNA
 <213> Viscum album coloratum

<220>

<221> misc_feature

<400> 11

gacgatggaa cctgcactcc ttccgaacct acggtgtgga ttgtgggtct aaatggcctg 60
 tgcgtcgacg tccgacatgg aaaattccac gatggaaatc cgatacagtt gtggccctgc 120
 aagtccaaca ccgataggaa tcagctgtgg acgatcagaa gggatggaac ctttcgatct 180
 aatagcaagt gcttgaccac ctatggctat cgtgatggca tgtatgtcat gatctacaac 240
 tgtaatacgg ccgtgcggga ggccactatt tggcaaatat gggaaaatgg aaccatcggt 300
 aatccaaaat ccagtctggt actgggagca gcatctggaa gcagccgcac tacgattact 360
 gtgcaaacac aggcttactc gttgggacag ggctggcttg ccagccatga tacagccctt 420
 cgcgaggtaa ccatatacgg tttccgtgac ctttgcattg aagctaattg atcgagtgtg 480
 tkggtggaga cttgtgtgag tcacaagcag aacaaaaaat gggctttgta cggggatggt 540
 tctatacgcc ccaaacaaaa ccgaaaccaa tgcttcacct gccagaaaga ctccgtttca 600
 accgtaatca atattgttag ctgcagcgca ggatcgtctg ggcagcgatg ggtgtttacc 660

aataaagggga ccaattttgaa tttaaagaat gggttgggtcc tggatgtggc gcaatcaaat 720
 ccaagcctcc gccgaataat catctacca gccaccggaa agcctaataa aatgtggctt 780
 cccgtgccca 789

<210> 12
 <211> 263
 <212> PRT
 <213> Viscum album coloratum

<220>

<221> misc_feature
 <222> 161
 <223> Xaa = any amino acid

<400> 12

Asp	Asp	Gly	Thr	Cys	Thr	Pro	Ser	Glu	Pro	Thr	Val	Trp	Ile	Val	Gly
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Leu	Asn	Gly	Leu	Cys	Val	Asp	Val	Arg	His	Gly	Lys	Phe	His	Asp	Gly
		20						25					30		
Asn	Pro	Ile	Gln	Leu	Trp	Pro	Cys	Lys	Ser	Asn	Thr	Asp	Arg	Asn	Gln
		35					40					45			
Leu	Trp	Thr	Ile	Arg	Arg	Asp	Gly	Thr	Ile	Arg	Ser	Asn	Ser	Lys	Cys
	50					55					60				
Leu	Thr	Thr	Tyr	Gly	Tyr	Arg	Asp	Gly	Met	Tyr	Val	Met	Ile	Tyr	Asn
	65				70					75					80
Cys	Asn	Thr	Ala	Val	Arg	Glu	Ala	Thr	Ile	Trp	Gln	Ile	Trp	Glu	Asn
				85					90					95	
Gly	Thr	Ile	Val	Asn	Pro	Lys	Ser	Ser	Leu	Val	Leu	Gly	Ala	Ala	Ser
			100					105					110		
Gly	Ser	Ser	Arg	Thr	Thr	Leu	Thr	Val	Gln	Thr	Gln	Ala	Tyr	Ser	Leu
		115					120					125			
Gly	Gln	Gly	Trp	Leu	Ala	Ser	His	Asp	Thr	Ala	Pro	Arg	Glu	Val	Thr
	130					135					140				
Ile	Tyr	Gly	Phe	Arg	Asp	Leu	Cys	Met	Glu	Ala	Asn	Gly	Ser	Ser	Val
	145				150					155					160
Xaa	Val	Glu	Thr	Cys	Val	Ser	His	Lys	Gln	Asn	Gln	Lys	Trp	Ala	Leu
				165					170					175	
Tyr	Gly	Asp	Gly	Ser	Ile	Arg	Pro	Lys	Gln	Asn	Arg	Asn	Gln	Cys	Leu
			180					185					190		
Thr	Cys	Gln	Lys	Asp	Ser	Val	Ser	Thr	Val	Ile	Asn	Ile	Val	Ser	Cys
		195					200					205			
Ser	Ala	Gly	Ser	Ser	Gly	Gln	Arg	Trp	Val	Phe	Thr	Asn	Lys	Gly	Thr
	210					215					220				

Ile Leu Asn Leu Lys Asn Gly Leu Val Leu Asp Val Ala Gln Ser Asn
225 230 235 240

Pro Ser Leu Arg Arg Ile Ile Ile Tyr Pro Ala Thr Gly Lys Pro Asn
245 250 255

Gln Met Trp Leu Pro Val Pro
260

<210> 13
<211> 357
<212> DNA
<213> Viscum album coloratum

<220>

<221> misc feature
<222> 19, 57, 190, 331
<223> "n" = any single nucleotide

<400> 13

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ccaccaaaca tgtacatgct cgagctggag acgagttggg gtcgacaatc cacccaagtc 120
cagcagtcca aggatggcat ttttaatacc caaataagat tgcagatttc cgccggtaac 180
tttgtgacgn tgagcaatgt tcgcgacgtg atctccagct tggcgatcat gttgttcgaa 240
tgcagtggtc ggccattctc ctctctcgac cacccttcgc cgctgctcct aagggtccgtc 300
gtggatgcgg ccaacgatgt cacctgcact ntttccgaac ccaccgtgcg catcgta 357

<210> 14
<211> 119
<212> PRT
<213> Viscum album coloratum

<220>
<221> misc feature
<222> 7, 64, 111
<223> Xaa = any amino acid

<400> 14

Ala Arg Phe Asn Pro Ile Xaa Trp Arg Leu Arg Arg Gln Ile Asn Ser
1 5 10 15

Gly Glu Ser Ser Pro Pro Asn Met Tyr Met Leu Glu Leu Glu Thr Ser
20 25 30

Trp Gly Arg Gln Ser Thr Gln Val Gln Gln Ser Lys Asp Gly Ile Phe
35 40 45

Asn Thr Gln Ile Arg Leu Gln Ile Ser Ala Gly Asn Phe Val Thr Xaa
50 55 60

Ser Asn Val Arg Asp Val Ile Ser Ser Leu Ala Ile Met Leu Phe Glu
65 70 75 80
Cys Ser Gly Arg Pro Phe Ser Ser Leu Asp His Pro Ser Pro Leu Leu
85 90 95
Leu Arg Ser Val Val Asp Ala Ala Asn Asp Val Thr Cys Thr Xaa Ser
100 105 110
Glu Pro Thr Val Arg Ile Val
115

<210> 15
<211> 522
<212> DNA
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 15
tacacagatc tggagcgata cgccgggtcat agggaccaga tccctctggg tatagaggaa 60
ctcattcaat ccgtctcggc gcttcggttat ccaggcggca gcacccgggc ccaagctcgt 120
tcccttataa tcctcattca gatgatctcc gaggccgcga gattcaatcc catcttttgg 180
agggctcgcc aatacattaa cagcggggag tcattttcttc ccgacatgta catgctcgag 240
ctggagacta gttggggcca acaatccacg caagtccagc agtctacgga tggcgttttt 300
aataacccat ttcggttggg tatatccacc ggtaacttcg tgacgttgag caatgttcgc 360
gacgtgatcg ccagcttagc gatcatgttg tttgtatgta gggaccgacc atcttctctc 420
gacgtgcgct attggccgct ggtcatacga cccgtcttgg aaaatagcgg cgccgtcgac 480
gatgttacct gcaactgttc cgaaccaccc gtgcgcacgc ta 522

<210> 16
<211> 174
<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 16

Tyr Thr Asp Leu Glu Arg Tyr Ala Gly His Arg Asp Gln Ile Pro Leu
1 5 10 15
Gly Ile Glu Glu Leu Ile Gln Ser Val Ser Ala Leu Arg Tyr Pro Gly
20 25 30

Gly Ser Thr Arg Ala Gln Ala Arg Ser Leu Ile Ile Leu Ile Gln Met
 35 40 45
 Ile Ser Glu Ala Ala Arg Phe Asn Pro Ile Phe Trp Arg Ala Arg Gln
 50 55 60
 Tyr Ile Asn Ser Gly Glu Ser Phe Leu Pro Asp Met Tyr Met Leu Glu
 65 70 75 80
 Leu Glu Thr Ser Trp Gly Gln Gln Ser Thr Gln Val Gln Gln Ser Thr
 85 90 95
 Asp Gly Val Phe Asn Asn Pro Phe Arg Leu Gly Ile Ser Thr Gly Asn
 100 105 110
 Phe Val Thr Leu Ser Asn Val Arg Asp Val Ile Ala Ser Leu Ala Ile
 115 120 125
 Met Leu Phe Val Cys Arg Asp Arg Pro Ser Ser Ser Asp Val Arg Tyr
 130 135 140
 Trp Pro Leu Val Ile Arg Pro Val Leu Glu Asn Ser Gly Ala Val Asp
 145 150 155 160
 Asp Val Thr Cys Thr Ala Ser Glu Pro Thr Val Arg Ile Val
 165 170

<210> 17
 <211> 18
 <212> DNA
 <213> Viscum album coloratum

<220>

<221> misc_feature
 <222> 3, 6, 12, 16
 <223> n = inosine

<400> 17

gtnacncatc anaacngg 18

<210> 18
 <211> 19
 <212> DNA
 <213> Viscum album coloratum

<220>

<221> misc_feature
 <222> 3, 6, 13, 16
 <223> n = inosine

<400> 18

acnatncgca cngtnggtc 19

<210> 19
 <211> 29
 <212> PRT
 <213> Viscum album coloratum

 <220>

 <221> misc_feature

 <400> 19
 Tyr Glu Arg Glu Lys Leu Arg Val Thr His Gln Thr Thr Gly Asp Gln
 1 5 10 15
 Tyr Phe Lys Phe Ile Thr Leu Leu Ala Asp Gln His Ser
 20 25

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 <213> Viscum album coloratum

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 <400> 20
 Tyr Glu Arg Glu Lys Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
 1 5 10 15
 Tyr Phe Arg Phe Ile Thr Leu Leu Ala Asp Thr Val
 20 25

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 <213> Viscum album Loranthacea

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 <400> 21
 Tyr Glu Arg Glu Lys Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
 1 5 10 15
 Tyr Phe Arg Phe Ile Thr Leu Leu Ala Asp Thr Val Ser Ser
 20 25 30

 <210> 22
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 <213> Viscum album coloratum

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 <223> Xaa = any amino acid

<400> 22

Asp Val Thr Xaa Thr Ala Ser Glu Pro Thr Val Arg Ile
1 5 10

<210> 23

<211> 20

<212> PRT

<213> Viscum album loranthacea

<220>

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<400> 23

Asp Asp Val Thr Ser Ser Ala Ser Glu Pro Thr Val Arg Ile Val Gly
1 5 10 15

Arg Asn Gly Met
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<211> 10

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 24

Tyr Glu Arg Leu Lys Leu Tyr Val Thr His
1 5 10

<210> 25

<211> 28

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 25

Tyr Glu Arg Leu Arg Leu Arg Val Thr His Gln Thr Thr Gly Asp Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp Tyr Val
20 25

<210> 26

<211> 17

<212> PRT

<213> Viscum album coloratum

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<221> misc_feature

<400> 26

His Gln Thr Thr Gly Asp Glu Tyr Phe Arg Phe Ile Thr Leu Leu Arg
1 5 10 15

Asp

<210> 27

<211> 26

<212> PRT EMLA

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 27

Tyr Glu Arg Leu Lys Leu Tyr Val Thr His Gln Thr Thr Gly Glu Glu
1 5 10 15

Tyr Phe Arg Phe Ile Thr Leu Leu Arg Asp
20 25

<210> 28

<211> 30

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 28

Ile Phe Pro Lys Gln Tyr Pro Ile Ile Asn Phe Thr Thr Ala Gly Ala
1 5 10 15

Thr Val Gln Ser Tyr Thr Asn Phe Ile Arg Ala Val Arg Gly
20 25 30

<210> 29

<211> 26

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 29

Glu Asp Arg Pro Ile Lys Phe Ser Arg Glu Gly Ala Thr Ser Gln Ser
1 5 10 15

Tyr Lys Gln Phe Ile Glu Ala Leu Arg Glu

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<400> 30
Tyr Val
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<210> 31
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<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 31

Tyr Val Ser Ser Gly Ser Phe Ser Asn Glu Ile Pro Leu Leu Arg Gln
1 5 10 15

Ser Thr Ile Pro Val Ser Asp Ala Gln Arg Phe Val Leu
20 25

<210> 32
<211> 29
<212> PRT
<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 32

Tyr Val Ser Ser Gly Ser Pro Ser Asn Glu Ile Pro Leu Leu Arg Gln
1 5 10 15

Ser Thr Ile Pro Val Ser Asp Ala Gln Arg Phe Val Leu
20 25

<210> 33
<211> 29

<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 33

Arg Leu Thr Thr Gly Ala Asp Val Arg His Glu Ile Pro Val Leu Pro
1 5 10 15

Asn Arg Val Gly Leu Pro Ile Asn Gln Arg Phe Ile Leu
20 25

<210> 34

<211> 27

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 34

Arg Leu Arg Gly Gly Leu Ile His Asp Ile Pro Val Leu Pro Asp Pro
1 5 10 15

Thr Thr Leu Gln Glu Arg Leu Arg Tyr Ile Thr
20 25

<210> 35

<211> 29

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 35

Val Glu Leu Thr Asn Gln Gly Gly Asp Ser Ile Thr Ala Ala Ile Asp
1 5 10 15

Val Thr Asn Leu Tyr Val Val Ala Tyr Gln Ala Gly Asp
20 25

<210> 36

<211> 29

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 36

Val Glu Leu Thr Asn Gln Gly Gln Asp Ser Val Thr Thr Ala Ile Asp
1 5 10 15

Val Thr Asn Ala Tyr Val Val Ala Tyr Gln Ala Gly Asp
20 25

<210> 37

<211> 29

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 37

Val Glu Leu Ser Asn His Ala Glu Leu Ser Val Thr Leu Ala Leu Asp
1 5 10 15

Val Thr Asn Ala Tyr Val Val Gly Tyr Arg Ala Gly Asn
20 25

<210> 38

<211> 29

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 38

Val Glu Leu Ser Asn Ser Asp Thr Glu Ser Ile Glu Val Gly Ile Asp
1 5 10 15

Val Thr Asn Ala Tyr Val Val Ala Tyr Arg Ala Gly Thr
20 25

<210> 39

<211> 22

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 39

Gln Ser Tyr Phe Leu Arg Asp Ala Pro Asp Gly Ala Glu Arg His Leu
1 5 10 15

Phe Thr Gly Thr Thr Arg
20

<210> 40
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<212> PRT
<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 40
Gln Ser Tyr Phe Leu Arg Asp Ala Pro Arg Gly Ala Glu Thr His Leu
1 5 10 15

Phe Thr Gly Thr Thr Arg
20

<210> 41
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<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 41
Ser Ala Tyr Phe Phe His Pro Asp Asn Gln Glu Asp Ala Glu Ala Ile
1 5 10 15

Thr His Leu Phe Thr Asp Val Gln Asn Arg
20 25

<210> 42
<211> 23
<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 42
Gln Ser Tyr Phe Leu Arg Asp Ala Pro Ser Ser Ala Ser Asp Tyr Leu
1 5 10 15

Phe Thr Gly Thr Asp Gln His
20

<210> 43
<211> 25
<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 43

Ser Ser Leu Pro Phe Asn Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala
1 5 10 15

Gly His Arg Asp Gln Ile Pro Leu Gly
20 25

<210> 44

<211> 25

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 44

Ser Ser Leu Pro Phe Asn Gly Ser Tyr Pro Asp Leu Glu Arg Tyr Ala
1 5 10 15

Gly His Arg Asp Gln Ile Pro Leu Gly
20 25

<210> 45

<211> 28

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 45

Tyr Phe Thr Ala Phe Gly Gly Asn Tyr Asp Arg Leu Glu Gln Leu Ala
1 5 10 15

Gly Asn Leu Arg Glu Asn Ile Glu Leu Gly Asn Gly
20 25

<210> 46

<211> 27

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 46

Ser Leu Pro Phe Tyr Gly Thr Tyr Gly Asp Leu Glu Arg Trp Ala His
1 5 10 15

Gln Ser Arg Gln Gln Ile Pro Leu Gly Leu Asp
20 25

<210> 47

<211> 24

<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 47

Ile Glu Glu Leu Ile Gln Ser Val Ser Ala Leu Ile Tyr Pro Gly Gly
1 5 10 15

Ser Thr Arg Ala Gln Ala Arg Ser
20

<210> 48

<211> 24

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 48

Ile Arg Gln Leu Ile Gln Ser Val Thr Ala Leu Ile Phe Pro Gly Gly
1 5 10 15

Ser Thr Arg Thr Gln Ala Arg Ser
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<210> 49

<211> 25

<212> PRT

<213> Ricin toxin

<220>

<221> misc_feature

<400> 49

Pro Leu Glu Glu Ala Ile Ser Ala Leu Tyr Tyr Tyr Ser Tyr Gly Gly
1 5 10 15

Thr Gln Leu Pro Thr Leu Ala Arg Ser
20 25

<210> 50

<211> 22

<212> PRT

<213> Arbin

<220>

<221> misc_feature

<400> 50

Ala Leu Thr His Gly Thr Ser Phe Phe Arg Ser Gly Gly Asn Arg Asn
1 5 10 15

Glu Glu Lys Ala Arg Thr
20

<210> 51
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<212> PRT
<213> Viscum album coloratum

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<221> misc_feature
<222> 7
<223> Xaa = any amino acid

<400> 51
Ala Arg Phe Asn Pro Ile Xaa Trp Arg Leu Arg Arg Gln Ile Asn Ser
1 5 10 15

Gly Glu Ser

<210> 52
<211> 30
<212> PRT
<213> Viscum album coloratum

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<221> misc_feature

<400> 52
Leu Ile Ile Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro
1 5 10 15

Ile Phe Trp Arg Ala Arg Gln Tyr Ile Asn Ser Gly Glu Ser
20 25 30

<210> 53
<211> 30
<212> PRT
<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 53
Ile Leu Ile Leu Ile Gln Met Ile Ser Glu Ala Ala Arg Phe Asn Pro
1 5 10 15

Ile Leu Trp Arg Tyr Arg Gln Tyr Ile Asn Ser Gly Ala Ser
20 25 30

<210> 54
<211> 30
<212> PRT

<213> Risin toxin

<220>

<221> misc_feature

<400> 54

PHE ILE ILE CYS ILE GLN MET ILE SER GLU ALA ALA ARG PHE GLN
5 10 15
TYR ILE GLU GLY GLU MET ARG THR ARG ILE ARG TYR ASN ARG ARG
20 25 30

<210> 55

<211> 30

<212> PRT

<213> Abrin

<220>

<221> misc_feature

<400> 55

LEU ILE VAL ILE ILE GLN MET VAL ALA GLU ALA ALA ARG PHE ARG
5 10 15
TYR ILE SER ASN ARG VAL ARG VAL SER ILE GLN THR GLY THR ALA
20 25 30

<210> 56

<211> 29

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 56

SER SER PRO PRO ASN TYR MET LEU GLU LEU GLU THR SER TRP GLY
5 10 15
ARG GLN SER THR GLN VAL GLN GLN SER LYS ASP GLY ILE PHE
20 25

<210> 57

<211> 29

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 57

PHE LEU PRO ASP MET TYR MET LEU GLU LEU GLU THR SER TRP GLY
5 10 15
GLN GLN SER THR GLN VAL GLN GLN SER THR ASP GLY VAL PHE
20 25

<210> 58

<211> 29

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 58

PHE LEU PRO ASP VAL TYR MET LEU GLU LEU GLU THR SER TRP GLY
5 10 15
GLN GLN SER THR GLN VAL GLN HIS SER THR ASP GLY VAL PHE
20 25

<210> 59

<211> 29

<212> PRT

<213> Rizin toxin

<220>

<221> misc_feature

<400> 59

SER ALA PRO ASP PRO SER VAL ILE THR LEU GLU ASN SER TRP GLY
5 10 15
ARG LEU SER THR ALA ILE GLN GLU SER ASN GLN GLY ALA PHE
20 25

<210> 60

<211> 29

<212> PRT

<213> Arbin

<220>

<221> misc_feature

<400> 60

PHE GLN PRO ASP ALA ALA MET ILE SER LEU GLU ASN MET TRP ASP
5 10 15
ASN LEU SER ARG GLY VAL GLN GLU SER VAL GLN ASP THR PHE
20 25

<210> 61

<211> 24

<212> PRT

<213> Viscum album coloratum

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<221> misc_feature

<222> 17

<223> Xaa = any amino acid

<400> 61

ASN THR GLN ILE ARG LEU GLN ILE SER ALA GLY MET PHE VAL THR
5 10 15
SER Xaa ASN VAL ARG ASP VAL ILE SER
20

<210> 62

<211> 24

<212> PRT

<213> Viscum album coloratum
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 ASN ASN PRO PHE ARG LEU GLY ILE SER THR GLY MET PHE VAL THR
 5 10 15
 LEU SER ASN VAL ARG ASP VAL ILE ALA
 20
 <210> 63
 <211> 24
 <212> PRT
 <213> Viscum album loranthacea
 <220>
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 <400> 63
 ASN ASN PHE ILE ARG LEU ALA ILE PHE PHE GLY MET PHE VAL THR
 5 10 15
 LEU THR ASN VAL ARG ASP VAL ILE ALA
 20
 <210> 64
 <211> 24
 <212> PRT
 <213> Rizin toxin
 <220>
 <221> misc_feature
 <400> 64
 ALA SER PRO ILE GLN LEU GLN ARG ARG ASN GLY SER LYS PHE SER
 5 10 15
 VAL TYR ASP VAL SER ILE LEU ILE PRO
 20
 <210> 65
 <211> 25
 <212> PRT
 <213> Abrin
 <220>
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 <400> 65
 PHE ASN GLN VAL THR LEU THR ASN ILE ARG ASN GLU PRO VAL ILE
 5 10 15
 VAL ASP SER LEU SER HIS PRO THR VAL ALA
 20 25
 <210> 66
 <211> 16
 <212> PRT
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<220>

<221> misc_feature

<400> 66

SER LEU ALA ILE MET LEU PHE GLU CYS SER GLY ARG PRO PHE SER
5 10 15

SER

<210> 67

<211> 16

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 67

SER LEU ALA ILE MET LEU PHE VAL CYS ARG ASP ARG PHE SER SER
5 10 15

SER

<210> 68

<211> 16

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 68

SER LEU ALA ILE MET LEU PHE VAL CYS GLY GLU ARG PHE SER SER
5 10 15

SER

<210> 69

<211> 17

<212> PRT

<213> Risin toxin

<220>

<221> misc_feature

<400> 69

ILE ILE ALA LEU MET VAL TYR ARG CYS ALA PHE PHE PHE SER SER
5 10 15

GLN PHE

<210> 70

<211> 15

<212> PRT

<213> Abrin

<220>

<221> misc_feature

<400> 70
VAL LEU ALA LEU MET LEU PHE VAL CYS ASN PRO PRO PRO PRO ASN
5 10 15

<210> 71
<211> 17
<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 71
LEU ASP HIS PRO SER PRO LEU LEU LEU ARG SER VAL VAL ASP ALA
5 10 15
ALA ASN

<210> 72
<211> 19
<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 72
ASP VAL ARG TYR TRP PRO LEU VAL ILE ARG PRO VAL LEU GLU ASN
5 10 15
SER GLY ALA VAL

<210> 73
<211> 12
<212> PRT
<213> Risin toxin

<220>

<221> misc_feature

<400> 73
SER LEU LEU ILE ARG PRO VAL VAL PRO ASN PHE ASM
5 10

<210> 74
<211> 10
<212> PRT
<213> Abrin

<220>

<221> misc_feature

<400> 74
ALA ASN GLN SER PRO LEU LEU ILE ARG SER
5 10

<210> 75
<211> 13

<212> PRT
<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 75
ASP VAL THR CYS THR ALA SER GLU CYS THR VAL ARG ILE
5 10

<210> 76

<211> 14

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<222> 4, 6

<223> Xaa = any amino acid

<400> 76

ASP VAL THR Xaa THR Xaa SER GLU PRO THR VAL ARG ILE VAL
5 10

<210> 77

<211> 15

<212> PRT

<213> Viscum album coloratum

<220>

<221> misc_feature

<400> 77
ASP ASP VAL THR CYS THR ALA SER GLU PRO THR VAL ARG ILE VAL
5 10 15

<210> 78

<211> 20

<212> PRT

<213> Viscum album loranthacea

<220>

<221> misc_feature

<400> 78
ASP ASP VAL THR SER SER ALA SER GLU PRO THR VAL ARG ILE VAL
5 10 15
GLY ARG ASN GLY MET
20

<210> 79

<211> 19

<212> PRT

<213> Rizin toxin

<220>

<221> misc_feature

<400> 79

ALA ASP VAL CYS MET ASP PRO GLU PRO ILE VAL ARG ILE VAL GLY
5 10 15

ARG ASN GLY MET

<210> 80

<211> 20

<212> PRT

<213> Abrin

<220>

<221> misc_feature

<400> 80

SER LYS ILE CYS SER SER ARG TYR GLU PRO THR VAL ARG ILE GLY
5 10 15

GLY ARG ASP GLY MET
20

*P1
Conclude*